

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
2 June 2005 (02.06.2005)

PCT

(10) International Publication Number  
**WO 2005/050083 A1**

(51) International Patent Classification<sup>7</sup>: **F16L 59/14**, 1/12

(21) International Application Number:  
PCT/EP2004/013051

(22) International Filing Date:  
16 November 2004 (16.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
03078631.3 19 November 2003 (19.11.2003) EP

(71) Applicant (for all designated States except US): **SINGLE BUOY MOORINGS, INC.** [CH/CH]; 5, Route de Fribourg, CH-1723 Marly (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ROODULJN, Erik, Jan** [NL/MC]; Rue Comte Felix Castaldi 30, MC-98000 Monaco (MC). **WILLE, Hein** [NL/FR]; 9, rue Montée Saint Michel, F-06360 Eze (FR).

(74) Agent: **VAN WESTENBRUGGE, Andries**; Nederlands Octrooibureau, Scheveningseweg 82, P.O. Box 29720, NL-2502 LS The Hague (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

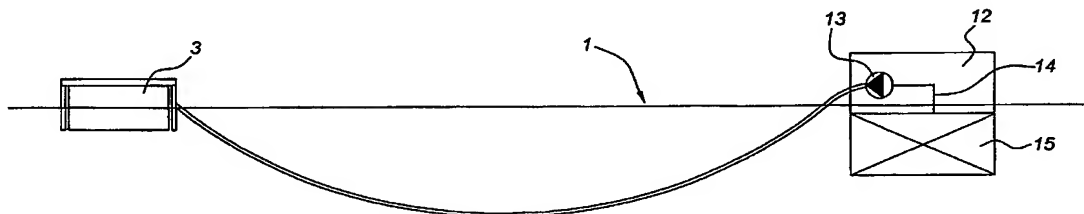
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF SUPPLYING OIL FROM A FLOATING PRODUCTION STRUCTURE TO AN OFFLOADING BUOY VIA A THERMALLY INSULATED FLEXIBLE TRANSFER DUCT



(57) Abstract: The invention relates to a method of supplying oil from a first floating structure to an offloading structure. The method comprises the steps of: - providing a flexible duct extending between the two structures at a water depth of between 50m and 500m, the duct comprising a flexible elastomeric material and having an internal diameter of at least 600 mm and a length of between 1500 and 3000 m, - providing at least one pump at the first structure and pumping the oil through the duct at a pressure between 5 bar and at a flow rate between 1000 and 50.000 m<sup>3</sup>/hr, characterized in - providing a single flexible duct, and - providing a wall thickness of the duct such that at water temperatures between 2°C and 20°C, preferably between 2°C and 10°C, the oil comprises at the first structure an inlet temperature  $T_{in}$  and at the second structure an outlet temperature  $T_o$  which is such that  $T_{in} - T_o$  is smaller than or equal to 15°C, preferably smaller than 5°C.